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PCT

11053P1 NOTIFICATION OF TRANSMITTAL OF
THE INTERNATIONAL PRELIMINARY
EXAMINATION REPORT

(PCT Rule 71.1)

Date of mailing
(day/month/year)

10.11.2004

Applicant's or agent's file reference
11053P1 WO/JCM

IMPORTANT NOTIFICATION

International application No.
PCT/GB 03/02801

International filing date (day/month/year)
01.07.2003

Priority date (day/month/year)
01.07.2002

Applicant

RECKITT BENCKISER (UK) LIMITED et al.

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.
2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.
4. **REMINDER**

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

The applicant's attention is drawn to Article 33(5), which provides that the criteria of novelty, inventive step and industrial applicability described in Article 33(2) to (4) merely serve the purposes of international preliminary examination and that "any Contracting State may apply additional or different criteria for the purposes of deciding whether, in that State, the claimed inventions is patentable or not" (see also Article 27(5)). Such additional criteria may relate, for example, to exemptions from patentability, requirements for enabling disclosure, clarity and support for the claims.

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INTERNATIONAL PRELIMINARY EXAMINATION REPORT
(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 11053P1 WO/JCM	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/PEA/416)	
International application No. PCT/GB 03/02801	International filing date (<i>day/month/year</i>) 01.07.2003	Priority date (<i>day/month/year</i>) 01.07.2002
International Patent Classification (IPC) or both national classification and IPC A61L9/03		
Applicant RECKITT BENCKISER (UK) LIMITED et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 6 sheets, including this cover sheet.
- ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).
- These annexes consist of a total of 6 sheets.

3. This report contains indications relating to the following items:
- I ☒ Basis of the opinion
 - II ☐ Priority
 - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
 - IV ☐ Lack of unity of invention
 - V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
 - VI ☐ Certain documents cited
 - VII ☐ Certain defects in the international application
 - VIII ☐ Certain observations on the international application

Date of submission of the demand 02.02.2004	Date of completion of this report 10.11.2004
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer Marti, P Telephone No. +49 89 2399-7858 

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/GB 03/02801

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, Pages

1, 4-11 as originally filed
2, 3 received on 25.10.2004 with letter of 21.08.2004

Claims, Numbers

27-30 as originally filed
1-26 received on 25.10.2004 with letter of 21.08.2004

Drawings, Sheets

1/2-2/2 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:
- ☐ the drawings, sheets:

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. **PCT/GB 03/02801**

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-26
	No: Claims	
Inventive step (IS)	Yes: Claims	
	No: Claims	1-26
Industrial applicability (IA)	Yes: Claims	1-26
	No: Claims	

2. Citations and explanations

see separate sheet

Re Item V

Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

2.1 The following documents are referred to in this communication:

D1: US-A-5 644 866
D2: GB-A-2 347 860
D3: WO 01 39809 A
D4: WO 98 46283 A
D5: US-A-4 977 309
D6: GB-A-2 357 973

2.2 Document D1 discloses an electrically heated apparatus for dispensing an insecticide comprising a container (see 12 in Fig. 2), heating means (4), transfer means (13) and a portable power supply (5), wherein the heating means comprises a thin film heater (= organic PTC, see col. 2, l. 50-col. 3, l. 14, and Fig. 3, 4). The heating means comprises an organic PTC element (thermoplastic polyolefin resin, see col. 2, line 64), which can be considered as flexible. However, D1 does not disclose that the flexible film heater comprises two insulating laminars attached to opposed surfaces of the resistive material.

Document D2 discloses an electrically heated apparatus for dispensing fragranting materials comprising a container (= recesses, 11-14), heating means (16), transfer means (= fragrance carriers, 3-6) and a portable power supply (= battery, p. 2, l. 9-11), wherein the heating means comprises a flexible thin film heater (= electric resistance foil, see p. 2, l. 21-24).

Also D2 does not disclose that the flexible film heater comprises two insulating laminars attached to opposed surfaces of the resistive material.

Document D4 discloses an electrically heated apparatus for dispensing fragranting materials (= air freshener) comprising a container (= hollow body, 18), heating means (36) and transfer means (= wick matrix, 16), wherein the heating means comprises a flexible thin heater (= page 7, lines 22-27). In particular, the resistive material is in form of a resistive ink or a electric-conductive polymer coating comprising two insulating laminars is known from US-A-4912306, incorporated by reference in D4. However, D4 does not disclose that power supply should be portable.

- 2.3 None of the documents D1, D2 and D4 discloses an electrically heated apparatus for dispensing fragrancing material comprising all the features of present claim 1.

Therefore, the subject-matter of claim 1 can be considered as novel over the cited prior art (Art. 33.2 PCT).

- 2.4 The apparatus of claim 1 differs from the apparatus of D1 in that the thin film heater comprises two insulating laminars attached to opposed surfaces of the resistive material laminar. Starting from D1 as the closest prior art, the technical problem to be solved by claim 1 would be therefore to protect the resistive material of the heating means. However, such flexible thin film heaters provided with insulating laminars are well known in the art, for example from D4 (see point 2.2 above) or D5.

D5 discloses a flexible thin film heater comprising an organic PTC thermistor sheet (12) and insulating laminars (= insulating films, 20, 22).

Moreover, it is not clear to the examiner which **surprising or unexpected effect** could be expected from the fact that the thin film heater is provided with insulating laminars.

A skilled person looking for a way to solve the above mentioned problem would obviously consider the teaching of D4 or D5 to arrive at the proposed solution.

Therefore, the subject-matter of an amended claim 1 would not involve an inventive step in the light of D1 and either D4 or D5 (Art. 33.3 PCT).

- 2.5 The apparatus of claim 1 differs from the apparatus of D4 in that the power supply for energising the heating means is portable.

Starting from D4 as the closest prior art document, the technical problem to be solved would be the provision of a portable apparatus for dispensing fragrancing materials. However, portable apparatus comprising a portable power supply are also well known from the prior art, for example from D1 or D2.

A skilled person being aware of D4 and trying to solve the above mentioned problem would obviously look into D1 or D2 for the measures applied therein.

Hence, the subject-matter of claim 1 does not involve an inventive step in the light of D4 and either D1 or D2 (Art. 33.3 PCT).

2.6 Dependent claims 2-26 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of novelty (Art. 33.2 PCT) and/or inventive step (Art. 33.3 PCT), the reasons being as follows:

- 2.6.1 Claims 2, 3, 12, 14 and 15. The apparatus of D1 comprises a laminar (see Fig. 3 and 4) of polymer (= thermoplastic polyolefin resin) film material having PTC characteristics. Further, the battery cell is rechargeable (see col. 3, l. 15-16), the transfer means comprises a wick and the heating means is attached in proximity to the wick (see Fig. 2).
- 2.6.2 Claim 4. The resistive material of the heater in D4 can be in the form of a resistive ink (= page 7, lines 22-27).
- 2.6.3 Claim 5. The resistive material of D2 and D3 can be in the form of a resistive wire.
- 2.6.4 Claim 9. Document D5 discloses an inorganic PTC thermistor having an overall thickness of 500 μm (see col. 3, l. 1-15).
- 2.6.5 An electrically heated apparatus with the features of claims 13, 19-21 and 26 is known from D6.
- 2.6.6 Claims 6-8, 10-12, 16-18 and 22-25 contain only matter of normal design procedure and do not involve an inventive step as no particular or unexpected effect is apparent.

Certain observations on the international application

- 3. The features of the claims should be provided with reference signs placed in parentheses to increase the intelligibility of the claims (Rule 6.2(b)).

maximising the efficient volatilisation and diffusion of the fragrance in the enclosed volume of the room.

Attempts have been made to provide an electrically heated vapour dispensing apparatus which operates from a portable power supply, such as batteries. However, such apparatus suffer from two main drawbacks. Firstly, they are under-powered such that they have difficulty in heating the fragrance or other volatile substance to the required temperature, as well as heating the volatile substance sufficiently rapidly. Secondly, batteries are not able to volatilise the fragrance for a long enough period to be acceptable to consumers. With many conventional apparatus the operating life of a battery power source would be only a matter of hours.

According to the present invention, there is provided an electrically heated apparatus for dispensing fragrancing materials and other volatile substances to an enclosed volume comprising a container containing a quantity of a volatile substance, heating means, transfer means for transferring said volatile substance towards said heating means and a portable power supply for energising said heating means, characterised in that said heating means comprises a flexible thin film heater comprising a laminate having at least one laminar of resistive material and two insulating laminars attached to opposed surfaces of the resistive material laminar. Other aspects of the present invention are defined in the attached claims.

Embodiments of the present invention will now be described, by way of example only, with reference to the accompanying drawings in which:-

Figure 1 is a schematic cross-sectional view through a first embodiment of electrically heated vapour dispensing apparatus according to the present invention;

Figure 2 is a schematic cross-sectional view through a second embodiment of electrically heated vapour dispensing apparatus according to the present invention;

Figure 3 is a schematic cross-sectional view through a third embodiment of electrically heated vapour dispensing apparatus according to the present invention;

Figure 4 is a schematic cross-sectional view through a fourth embodiment of electrically heated vapour dispensing apparatus according to the present invention;

Figure 5 is a plan view of a heating means for use in the apparatus of Figure 1 to 4; and

Figure 6 is a cross-sectional view of the heating means taken on line VI-VI of Figure 5.

Figure 1 shows a first embodiment of electrically heated vapour dispensing apparatus 1 which comprises a housing 2 containing a fragrance reservoir 4, a capillary tube 5, a porous element 6, heating means 7, control circuitry (not shown) and a portable power supply (not shown).

The housing 2 has a planar base 9 allowing the apparatus 1 to be stood upright on a flat surface. The housing 2 defines an interior 10 of the apparatus 1 in which the other components of the apparatus 1 are located. At or near an upper end of the housing 2 are provided a number of air holes 3 providing communication between the interior 10 and the surrounding atmosphere. The air holes 3 allow volatilised fragrance to emanate from the interior 10.

The housing 2 may be formed from a thermoplastic or thermosetting polymeric material which has sufficient heat tolerance such that it is not undesirably softened or melted when the heating means 7 is energised during normal use of the apparatus 1. Typical examples of known materials which would be suitable include polymers and/or co-polymer resin compositions based on:- nylons,

1. An electrically heated apparatus for dispensing
5 fragrancing materials and other volatile
 substances to an enclosed volume comprising a
 container containing a quantity of a volatile
 substance, heating means, transfer means for
10 transferring said volatile substance towards
 said heating means and a portable power supply
 for energising said heating means, characterised
 in that said heating means comprises a flexible
 thin film heater comprising a laminate having at
 least one laminar of resistive material and two
15 insulating laminars attached to opposed surfaces
 of the resistive material laminar.
2. Electrically heated apparatus as claimed in
20 claim 1 wherein the resistive material has
 positive temperature coefficient
 characteristics.
3. Electrically heated apparatus as claimed in
25 claim 1 or claim 2 wherein the resistive
 material is a polymer thick film material or a
 polymer thin film material.
4. Electrically heated apparatus as claimed in any
30 preceding claim wherein the resistive material
 is formed at least partially from resistive ink.
5. Electrically heated apparatus as claimed in any
35 of claims 1 to 3 wherein the resistive material
 is formed at least partially from resistive
 wire.

- 5 6. Electrically heated apparatus as claimed in claim 4 or claim 5 wherein the laminar of resistive material is formed from one or more layers of resistive ink and/or resistive wire each layer having a thickness of between 10 and 1000 microns.
- 10 7. Electrically heated apparatus as claimed in claim 4 or claim 5 wherein the laminar of resistive material is formed from one or more layers of resistive ink and/or resistive wire each layer having a thickness of between 10 and 100 microns.
- 15 8. Electrically heated apparatus as claimed in claim 4 or claim 5 wherein the laminar of resistive material is formed from one or more layers of resistive ink and/or resistive wire each layer having a thickness of between 20 and 20 50 microns.
- 25 9. Electrically heated apparatus as claimed in any preceding claim wherein the thin film heater has an overall thickness of between 20 and 1000 microns.
- 30 10. Electrically heated apparatus as claimed in any preceding claim wherein the thin film heater has an overall thickness of between 40 and 100 microns.
- 35 11. Electrically heated apparatus as claimed in any preceding claim wherein the portable power supply comprises one or more battery cells.

12. Electrically heated apparatus as claimed in
claim 11 wherein the battery cell or cells are
rechargeable.
- 5 13. Electrically heated apparatus as claimed in any
preceding claim wherein said transfer means
comprises a capillary tube.
- 10 14. Electrically heated apparatus as claimed in any
of claims 1 to 12 wherein said transfer means
comprises a wick or capillary film.
- 15 15. Electrically heated apparatus as claimed in
claim 14 wherein said heating means is attached
to or held in proximity to said wick or
capillary film.
- 20 16. Electrically heated apparatus as claimed in
claim 15 wherein said heating means is located
at least partially within said wick.
- 25 17. Electrically heated apparatus as claimed in
claim 16 wherein said wick is cylindrical and
said heating means is located in a bore of the
cylinder.
- 30 18. Electrically heated apparatus as claimed in
claim 15 wherein said heating means is wrapped
at least partially around an outer surface of
said wick.
- 35 19. Electrically heated apparatus as claimed in any
preceding claim further comprising timing means
operable to energise said heating means
periodically.

20. Electrically heated apparatus as claimed in claim 19 wherein the periodicity is pre-programmed.

5

21. Electrically heated apparatus as claimed in claim 19 wherein the periodicity is user defined.

10 22. Electrically heated apparatus as claimed in any of claims 19 to 21 wherein each period of energisation is for between 1 second and 5 minutes.

15 23. Electrically heated apparatus as claimed in any of claims 19 to 21 wherein each period of energisation is for between 1 second and 1 minute.

20 24. Electrically heated apparatus as claimed in any of claims 19 to 21 wherein each period of energisation is for between 1 second and 10 seconds.

25 25. Electrically heated apparatus as claimed in any of claims 19 to 21 wherein each period of energisation is for between 1 second and 5 seconds.

30 26. Electrically heated apparatus as claimed in any preceding claim further comprising timing means operable to switch said heating means periodically from a low power state to a high power state.

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